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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/732,928	12/11/2000	Nobuo Shimazu	740107-136	2305

22204 7590 09/30/2003

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EXAMINER
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HUGHES, JAMES P

ART UNIT	PAPER NUMBER
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2881

DATE MAILED: 09/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/732,928

Applicant(s)

SHIMAZU ET AL.

Examiner

James P. Hughes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on the request filed on July 9, 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on July 9, 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☒ Interview Summary (PTO-413) Paper No(s). 10
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Drawings***

1. The amended drawings were received on July 9, 2003. These drawings are accepted.

### ***Response to Amendment***

2. Applicant's arguments, on pages 3-5 of the request for reconsideration, filed July 9, 2003, with respect to the rejection(s) of claim(s) 1-9 under 102(e) 103(a) and have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the IDS documents discussed below in sections 3 and 4.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 4-6, 8, and 9 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Bohlen et al. ("High Throughput Submicron Lithography with Electron Beam Proximity Printing"). Bohlen et al. ("High Throughput Submicron Lithography with Electron Beam Proximity Printing") is hereafter referred to as Bohlen. Bohlen teaches a method and apparatus for high throughput e-beam proximity lithography comprising; a tungsten hair pin e-beam source

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and collimating lens that emit a collimated electron beam and a stage that holds and moves an object (wafer) to be patterned via an electron beam passing through a mask substrate on which a plurality of masks (complimentary masks) with apertures are formed. The mask substrate is located in proximity to the substrate –typically about 0.5 mm – and portions of the mask are thinner than other portions. (p. 210, “Exposure Concept” section through p.211 “Transmission Masks” section, and Fig. 3, for example)

During exposure, a mask moving mechanism moves the mask substrate to expose the substrate to the e-beam passing through two complimentary patterns (or apertures) from separate masks, which are located on the same mask substrate a distance apart from each other. That is a pattern exposed in the object is exposed by to two exposures in which a first mask and a second mask (complimentary masks) are respectively used. (p. 211 “Complementary Masks” section through p. 212, “Pattern Positioning” section and Fig. 5, for example)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohlen et al. (“High Throughput Submicron Lithography with Electron Beam Proximity Printing”). Bohlen et al. (“High Throughput Submicron Lithography with Electron Beam Proximity Printing”) is hereafter referred to as Bohlen. Bohlen teaches a method and apparatus for high

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throughput e-beam proximity lithography as discussed above in section 3. However, Bohlen does not explicitly state that at least two of the plurality of masks formed on the substrate have identical patterns. As it is well known in the art to provide duplicate copies of identical patterns on a mask to increase throughput, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide duplicate copies of identical patterns on the mask substrate. Bohlen would have been motivated to do this, because as the title suggests, high throughput printing is desired.

### *Conclusion*

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In addition to the Bohlen reference discussed above in sections 3 and 4, the IDS reference Utsumi "Low Energy e-beam Proximity Projection Lithography" from the Nov/Dec 1999 issue of J. Vac. Sci. Technol. B 17(c) discloses that complimentary masks may be used in e-beam proximity exposure, thus reading on the current claims. (p. 2899, ll. 2-8 for example)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James P. Hughes whose telephone number is (703) 305-5675. The examiner can normally be reached on Monday - Friday 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (703) 308-4116. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

James P. Hughes  
Patent Examiner  
Art Unit 2881

JH

  
JOHN R. LEE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800